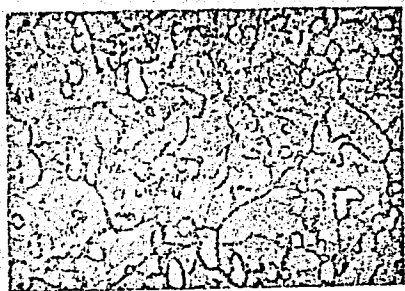


S/129/61/000/001/010/013
E111/E152

Block Structure and Recrystallization of Austenite in High Speed Steel



Фиг. 4. Микроструктура после закалки
от 1280° при исходной перлитной структуре.
×850.

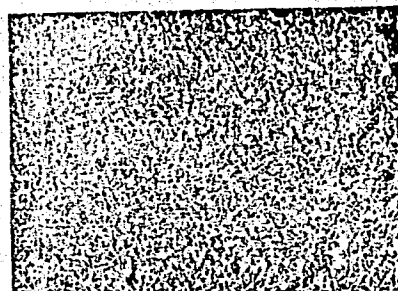


Fig. 5 a)

Fig. 5a

Microstructures obtained with various deformations are shown in Fig. 6 (increasing downwards). Figs 7, 8 and 9 give, respectively, the microstructure obtained after very rapid heating followed by holding at 1280 °C for 1 hour; that after hardening from 1280 °C

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S/129/61/000/001/010/013
E111/E152

Block Structure and Recrystallization of Austenite in High Speed Steel



Fig. 5a

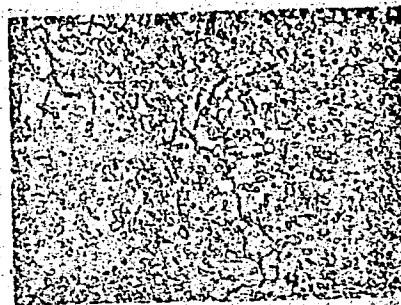


Fig. 5b

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S/129/61/000/001/010/013
E111/E152

Block Structure and Recrystallization of Austenite in High Speed Steel

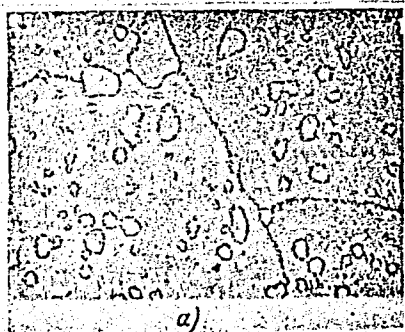


Fig. 6a

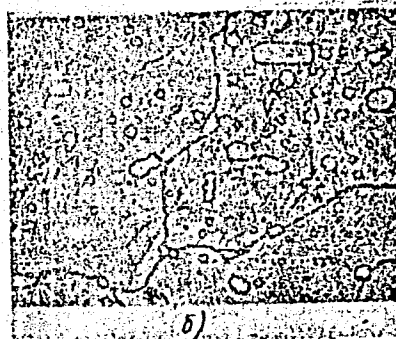


Fig. 6b

Card 6/9

S/129/61/000/001/010/013
E111/E152

Block Structure and Recrystallization of Austenite in High Speed Steel

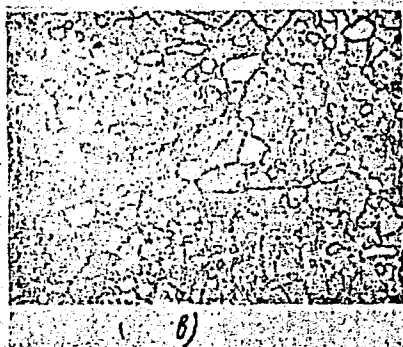


Fig. 66

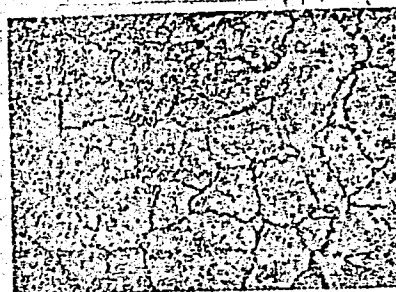


Fig. 7

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S/129/61/000/001/010/013
E111/E152

Block Structure and Recrystallization of Austenite in High Speed Steel



Fig. 8

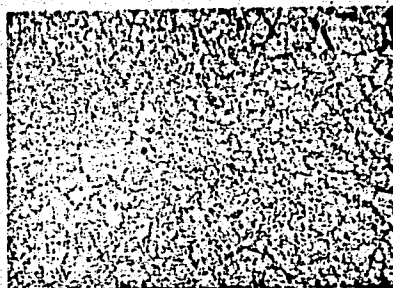


Fig. 9

followed by slow heating to the same temperature; and after hardening from 1280 °C followed by slow heating to 1150 °C, deformation and heating to 1280 °C. The author concludes that, depending on the initial structure and the heating conditions,
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S/129/61/000/001/010/013
E111/E152

Block Structure and Recrystallization of Austenite in High Speed Steel

austenite in high speed steel can be unrecrystallized (with metallographically revealed block structure of austenite grains;) or recrystallized (without sub-structure). Substructure is attributable to phase work hardening, a similar effect being produced by plastic deformation. Phase work hardening results in austenite recrystallization and formation of new grains without substructure; a similar effect being produced by plastic deformation. The possibility of austenite recrystallization associated with phase work hardening explains the reason for and formation mechanism of an abnormally large grain on reheating hardened high speed steel. ✓

There are 9 figures and 13 references: 11 Soviet and 2 English.

ASSOCIATION: Institut fiziki metallov AN SSSR

(Institute of Physics of Metals, AS USSR)

Card 9/9

34534
S/659/61/007/000/021/C44
D217/D303

18.1151

AUTHORS:

Sadovskiy, V.D., Sokolov, Ye.N., Lozinskiy, M.G.,
Petrova, S.N., Antipova, Ye.I., Gaydukov, M.G., and
Mirmel'shteyn, V.A.

TITLE:

Influence of thermo-mechanical treatment on the high
temperature strength properties of austenitic steel

SOURCE:

Akademiya nauk SSSR. Institut metallurgii. Issledova-
niya po zharoprochnym splavam, v. 7, 1961, 202-209

TEXT: A complex alloy steel of the austenitic class, widely used
in industry for manufacturing components for high temperature ser-
vice, was studied. During ageing of this steel, the complex chromi-
um and vanadium carbides responsible for its strengthening are pre-
cipitated. The material was heated to 1180 - 1200°C and rolled at
1000 - 1100°C at a speed of 5.7 m/min. After rolling, the billets
were immediately water quenched in order to prevent recrystalliza-
tion. The cross-section of the billets obtained was 11.5 x 11.5 mm
their length, 70 mm, and the reduction due to rolling, 25 - 30 %.

Card 1/4

Influence of thermo-mechanical ...

S/659/61/007/000/021/044
D217/D303

Control billets were heated simultaneously with those chosen for thermo-mechanical treatment, and were subsequently quenched from the above temperature. All billets, whether thermo-mechanically treated or only heated and quenched, were aged to a hardness of 310 - 320 Hb. After heat treatment, specimens for two series of tests were made from the billets. One series was used for studying structure during high temperature extension in vacuo. This also enabled the degree of deformation to be determined and photographs of the same portion to be taken at various stages of testing. Testing was carried out in a IMASh-5M machine at 900°C and a stress of 9.5 kg/mm², using specimens of 3 x 3 mm cross-section, heated by direct passage of current. The second series of tests, in which K.I. Terekhov participated, consisted of the standard tests for long-term strength at 650°C and stresses of 35 and 38 kg/mm², as well as at 700°C and a stress of 32 kg/mm². For this purpose, specimens of working portion diameter of 5 mm and 50 mm length were used. The microstructure of each specimen was studied in conjunction with these tests, particularly any peculiarities in structure appearing after thermo-mechanical treatment as compared with normal quenching.

Card 2/4

Influence of thermo-mechanical ...

S/659/61/007/000/021/044
D217/D303

The distribution of deformation along the length of the specimen, the intercrystalline and crystalline plasticity and the formation and propagation of cracks during fracture were given particular attention. It was found that high-temperature plastic deformation of the steel investigated, under conditions in which recrystallization processes are suppressed (thermo-mechanical treatment), leads to a considerable increase in long-term strength. The beneficial action of thermo-mechanical treatment is associated with structural characteristics of the steel which arise during high temperature plastic deformation and are fixed by cooling at a sufficiently high rate. Such characteristics are the complex geometry of grain boundaries, grain fragmentation and further refinement of the fine crystal structure. These structural characteristics of the steel retarded the development of fracture during creep, since (a) the characteristic serrated grain boundary structure retards the amalgamation between micro- and macro-cracks; (b) breaking-up of the fine crystal structure, and an increase in the density of immobilized dislocations render plastic deformation within the grains more difficult. There are 5 figures and 16 references: 15 Soviet-bloc and

Card 3/4

✓

Influence of thermo-mechanical ...

S/659/61/007/000/021/044
D217/D303

1 non-Soviet-bloc. The reference to the English-language publication reads as follows: P.W. Davies and J.P. Dennison, J. Inst. Metals, 87, 4, 1958.

Card 4/4

X

24,2200
18 7500

26567

also 1160 1482

S/126/61/012/002/019/019
E073/E535

AUTHORS: Sadovskiy, V.D., Rodigin, N.M., Smirnov, L.V.,
Filonchik, G.M. and Fakidov, I.G.

TITLE: On the influence of a magnetic field on the martensitic
transformations in steel

PERIODICAL: Fizika metallov i metallovedeniye, 1961, Vol.12, No.2,
pp.302-304

TEXT: The authors investigated the effect of a magnetic
field on martensitic transformations using specimens 3 mm dia.,
50 mm long, of steel 9X2H (9Kh2N) (0.9% C, 1.83% Cr, 0.53% Ni,
0.27% Si, 0.30% Mn, 0.01% S, 0.018% P). These specimens were
quenched from 850 and 1000°C in oil (so that they contained
respectively 11 and 37% residual austenite) and were then
subjected to a single magnetization by means of super-strong
magnetic field pulses (200-350 kOe, 3000 c.p.s.). Magnetic
measurements by a ballistic method did not show any increase in
the martensite. Experiments at liquid nitrogen temperature also
did not reveal a decrease [Abstractor's Note: Printing error for
increase] in the quantity of residual austenite as a result of
Card 1/4

26567

On the influence of a magnetic field ... S/126/61/012/002/019/019
E073/E535

applying the magnetic field; only the usual increase in the quantity of martensite corresponding to deep cooling was observed. An increase in the number of magnetization cycles to five also had no influence on the results. Thus, it can be concluded that in the general case pulse magnetization even with very strong fields does not produce transformation of residual austenite in quenched steel. Further experiments were made with steel 50XH23 (50KhN23) (0.52% C, 1.49% Cr, 22.85% Ni, 0.3% Si, 0.19% Mn, 0.068% P). Quenching of this steel from 1200°C yields a purely austenitic structure at room temperature. Martensitic transformation begins at about -100°C and at liquid nitrogen temperature the residual austenite amounts to 40-50%. Fifty pulse magnetization cycles (40-50 kOe) during cooling showed only a very slight effect on the quantity of martensite. Further experiments were carried out on the assumption that the martensitic point is lower for fine grained austenite than for coarse grained. Therefore, another series of experiments was carried out in which steel 50KhN23 was water quenched from 1200°C and cold rolled with a reduction of 60% and then again water quenched from 850, 900, 950 and 1000°C; this

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On the influence of a magnetic field ... S/126/61/012/002/019/019
E073/E535

material was used for producing magnetometric specimens. At room temperature all the specimens had a purely austenitic structure but their grain size differed. Cooling in liquid nitrogen revealed that specimens quenched from 850, 900 and 950°C contained 1 to 3% martensite but the coarser grain specimens, which were originally quenched from 1000°C, contained 20 to 30% martensite after cooling in liquid nitrogen. However, pulse magnetization at liquid nitrogen temperature produced intensive austenite to martensite transformation even in the fine grained specimens quenched from 850 to 900°C. The increase in the number of magnetization cycles did not have a great influence. It is concluded that pulse magnetization can intensify austenite to martensite transformation. In the investigated case, the austenite was artificially stabilized by its fine grain size and is in a supermetastable state at the liquid nitrogen temperature, being undercooled considerably below its normal martensitic point. Activation of the transformation under the effect of a magnetic field is probably due to magnetostriction effects associated with the presence of a certain quantity of the magnetic phase. The problem

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26567

On the influence of a magnetic field ... S/126/61/012/002/019/019
E073/E535

requires further study. There are 3 figures and 6 references:
4 Soviet and 1 English which reads as follows: Metal treatment
and Drop Forging, 1960, 27, No.180, 362.

ASSOCIATION: Institut fiziki metallov AN SSSR
(Institute of Physics of Metals AS USSR)

SUBMITTED: May 22, 1961

Card 4/4

34210
S/129/62/000/003/001/009
EM/E335

147500

AUTHOR:

Sadovskiy, V.D., Doctor of Technical Sciences,
Professor

TITLE:

Structural mechanism of phase changes on heating steel
and heat-treatment practice

PERIODICAL:

Metallovedeniye i termicheskaya obrabotka metallov,
no. 3, 1962, 2 - 7

TEXT:

Brief review of the state of knowledge on the phase-
transformations and austenite-structure formation when steel is
heated above the Ac_1 and Ac_3 critical points. It is based
mainly on work at the Institute of Physics of Metals of the
AS USSR, in which the author has been active. In the light of new
experimental evidence, present views do not give a sufficiently
full and exact description of processes really occurring,
particularly as regards heating of steel with a coarse-grained
crystallographic ordered structure (martensite, bainite,
tempered martensite). From the new investigations he draws
conclusions generally as follows, and discusses them.

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Structural mechanism of

S/129/62/000/005/001/009
E111/E535

fine grain is not always produced through austenization on heating steel above Ac_3 and the austenite-grain size obtained is not independent of pretreatment or initial structure. The austenite structure formed depends on the heating rate in the austenization-temperature range, the mechanism governing this relation not being that usually assumed (change in the ratio of nucleation and growth rates of austenite grains with change in degree of superheat. The Ac_3 point rises with decreasing heating rates and falls with acceleration of heating for the austenization process in hypo-eutectoid steel. Sometimes, the formation of a coarse austenite grain directly above Ac_3 is followed by grain refinement on heating further in the single-phase region. The influence of initial structure or that of austenite persists even in such cases: this manifests itself in texturing of fine grains within microvolume boundaries corresponding to the initial coarse grain. Austenization and austenite structure are greatly affected by previous plastic deformation in the alpha-state. The above conclusions are

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Structural mechanism of

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E111/E355

based on experiments mainly on alloy steels and several aspects of the physical mechanism of effects complicating phase recrystallization in such steels need further investigation. The effect of pretreatment on austenite structure is linked, in the most general sense, with the development of orientational compatibility in phase transformations. Whatever the physical interpretation of the separate details of the complex process of recrystallization in alloy steels, conclusions on heat-treatment needed to correct coarse-grained structure in castings, overheated forgings, etc., certain conclusions can already be drawn. These are mainly as follows for alloy structural steels:

- 1) all manifestations of structural "heredity" depend largely on the initial structure, difficulties often arising when this is of the crystallographic-alloy ordered type (hardening and tempering martensite, bainite);
- 2) in the case of hypoeutectoid steels, complete correction cannot be relied upon by heating to only slightly above A_{c3} ;
- 3) very rapid heating of a hardened steel, when the austenite

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Structural mechanism of

S/129/62/000/003/001/009
E111/E335

grain is restored to its former dimensions directly above Ac_3 is a special case;

4) higher heating temperatures in the austenite range can lead to grain refinement and correction of fracture when heating directly above Ac_3 fails to do so but the best and most

effective way of correcting the results of overheating is complete annealing (preferably with a heating rate which is not too low) with austenite decomposition on cooling to pearlite-type structures;

5) repetition of annealing, normalization or hardening (with formation of pearlitic-type structures on cooling) is also effective. Heat-treatment time can be insufficient unless allowance is made for the possible retardation of transformation through the influence of the coarse-grained nature of the structure (remaining after ordinary heating above Ac_3);

6) in the case of crystallographically-ordered structures quicker heating can favour completion of austenization at lower

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X

Structural mechanism of

S/129/62/000/003/001/009
E111/E335

temperatures. Excessive alloying can have a deleterious effect if it leads to the steel having a crystallographically-ordered structure. Normalization of the work is essential with alloy steels for case-hardening unless its structure has been carefully studied before and after heat-treatment; heating rate for austenization must be carefully watched at all stages. The author has reached the following conclusions for high-speed cutting steels:

- a) only after the temperature has risen over some critical value (1 150 °C, as a rule) is austenization accompanied by grain refinement and this is promoted by quicker heating;
- b) after normal hardening a fine-grained structure is preserved on rehardening if this is preceded by sufficiently high and prolonged tempering; double or triple isothermal annealing, preferably at 950 °C, is needed for correcting "naphthalene" fractures;
- c) after a high degree of plastic deformation in the austenite range, followed by rapid cooling, hardening can sometimes be carried out without intermediate annealing; deformation below

Card 5/6

SADOVSKIY, V.D., doktor tekhn.nauk

Observation of a dislocation structure in the KhN77TIUR alloy.
Metalloved. i term. obr. met. no.9:2-5 S '62. (MIRA 16:5)

1. Institut fiziki metallov AN SSSR.
(Nickel-chromium alloys—Metallography) (Dislocations in metals)

S/126/62/014/003/010/022
E111/E435

AUTHORS: Sadoyskiy, V.D., Bogacheva, G.N., Sokolov, B.K.
TITLE: Structural mechanism of phase transformations in the
heating of steel
PERIODICAL: Fizika metallov i metallovedeniye, v.14, no.3, 1962,
414-421

TEXT: The authors consider some general problems relevant to the structural mechanism of phase overcrystallization (defined by the author as "the process or combination of processes causing each single-crystal grain (crystallite) to break up into several new, randomly orientated grains") during heating of steel. The experimentally observed dependence of Ac_3 on heating rate is explained by the change in the structural mechanism of the austenite-formation process. As the rate increases the homogeneous mechanism gives way to a heterogeneous mechanism in which solution of excess ferrite in austenite is accelerated through increased surface diffusion. An important part is played by the appearance of moving non-coherent boundaries: when they are present the austenization is heterogeneous and vice versa.

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Structural mechanism of phase ...

S/126/62/014/003/010/022
E111/E435

With steel the homogeneous variant does not exclude the possible existence of moving boundaries at higher temperatures. For instance, with titanium or aluminium bronze the alpha → beta transformation occurring by the homogeneous mechanism does not lead to overcrystallization at temperatures right up to the melting point. The behaviour of Ti may be the "normal" behaviour. However, it is also possible that all cases of transformations accompanied by overcrystallization include the recrystallization effect. The authors emphasize that their approach needs further development but suggest that it provides a common basis for considering processes which at the first glance appear to be different. There are 8 figures. ✓

ASSOCIATION: Institut fiziki metallov AN SSSR
(Institute of Physics of Metals AS USSR)

SUBMITTED: May 6, 1962

Card 2/2

POPOV, Aleksandr Artem'yevich; SADOVSKIY, V.D., retsenzent;
BUR'KOV, M.M., red.izd-va; MAL'KOVA, N.T., tekhn. red. ---

[Phase transformations in metal alloys] Fazovye prevra-
shcheniia v metallicheskih splavakh. Moskva, Metallurg-
izdat, 1963. 310 p. (Alloys--Metallography) (MIRA 16:7)
(Phase rule and equilibrium)

NOSKOVA, N.I.; SADOVSKIY, V.D.; SOKOLOV, B.K.; TOMILOV, G.S.

Control of strain hardened steel articles by coercive force
measurements. Zav.lab. 29 no.7:819-821 '63. (MIRA 16:8)

1. Institut fiziki metallov AN SSSR.
(Steel--Testing)

L 8692-65 EWT(m)/EWP(b) RAEM(t) MJW/JD/MEK

ACCESSION NR: AT4046862

S/0000/64/000/000/0322/0325

AUTHOR: Sadovskiy, V. D.

B

TITLE: Method of observing the dislocations in KhN77TYuR alloy

SOURCE: AN SSSR. Nauchnyy sovet po problemam zharoprochnykh splavov. Issledovaniya staley i splavov (Studies on steels and alloys). Moscow, Izd-vo Nauka, 1964, 322-325

TOPIC TAGS: dislocation, metal dislocation, metal microsection, metal etching, alloy structure, dislocation detection / KhN77TYuR alloy

ABSTRACT: In an article previously published by the author, it was shown that in a hardened and aged type KhN77TYuR alloy, the dislocations may easily be revealed by elementary metallographic methods. It should be noted that, for this alloy, not only points but also dislocation loops are observed. During the tests it was noted that after etching, alloy points appeared showing the dislocation lines on the microsection. The length of the lines appearing depended on the duration of etching. When the etched surface was wiped with cotton wool and then again etched, a new group of dislocation lines appeared similar to the first ones. It is concluded that the detection of dislocations in the KhN77TYuR alloy is facilitated by the durability of etchings on the microsection. It was also found that a type

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ACCESSION NR: AT4046862

Me₂₃C₆ carbide is the decorative phase contained in the alloy which shows the dislocations. Therefore, as has already been shown by the first tests with Kh18N9T steel, these carbides are the ones ensuring successful etching. The method is very sensitive and shows dislocations 0.5-1 μ deep. These results are similar to those obtained using electron microscopes. All tests mentioned in the article relate to samples which were water quenched from 1100-1150C and aged for 16 hours at 750C. The samples were etched by a solution containing 4 g of CuSO₄, 20 cc of HCl and 20 cc of water. Similar results were obtained by etching with an alcoholic solution of picric and hydrochloric acid. "The tests described in the article were performed by A. F. Kartasheva." Orig. art. has: 4 figures.

ASSOCIATION: none

SUBMITTED: 16 Jun 64

ENCL: 00

SUB CODE: MM

NO REF SOV: 001

OTHER: 001

Card 2/2

L 9960-65 EWT(m)/T/EWP(k)/EWP(b) Pf-4 ASD(m)-3/ASD(f)-2 JD/HW/MLK
ACCESSION NR: AT4046864 S/0000/64/000/000/C331/0335

AUTHOR: Sokolov, Ye. N., Sadovskiy, V.D., Surkov, Yu. F., Chuprakova, N.P., Nichkova, M.M. B

TITLE: Investigation of the hardening and structural stability of austenitic alloys after high-temperature thermomechanical treatment 16

SOURCE: AN SSSR. Nauchnyy sovet po probleme zharoprochnyy splavov. Issledovaniya staley i splavov (Studies on steels and alloys). Moscow, Izd-vo Nauka, 1964, 331-335

TOPIC TAGS: thermomechanical treatment, alloy hardening, alloy structure, alloy crystallization, austenite, alloy heat resistance, alloy hardness, plastic deformation, alloy steel, austenitic steel

ABSTRACT: Improvement of heat resistance by high-temperature thermomechanical treatment is based on the creation of a special structure in the material during hot plastic deformation and its fixation by cooling which prevents recrystallization. The present article investigates the features of hardening of chromium-nickel-manganese austenitic steel with admixtures of tungsten and titanium after high-temperature thermomechanical treatment and aging. The effect of temperature and plastic deformation rate

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L 9960-65

ACCESSION NR: AT4046864

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were studied in relation to recrystallization in alloys rolled at a rate of 1.5 m/min at 950-1150C. Samples for rolling were 11.5x11.5X60 mm, and for upsetting were 50x50x70 mm. Special insulation was used during upsetting to prevent rapid cooling. All samples were cooled in water after plastic deformation. The effects of aging were studied by hardness measurements, while structural stability was measured by microstructural analysis. Hardness measurements showed that all alloys selected in the test showed a higher hardness than after the usual thermal treatment. The difference in hardness in comparison with the usual hardening procedures was 15-20 kg/mm² even after high temperature thermomechanical treatment at 800C for 32 hours. Similar results were obtained for other heating and aging temperatures. Impact toughness was also higher after high-temperature thermomechanical treatment (12-13 kg-m/cm² instead of 5-7). It is noted that aging for even 1000 hours leads to high stability of the investigated alloys, and that lowering of the rate of plastic deformation leads to redistribution of defects, avoiding "critical" fields where distorted grains appear. Microstructural analysis also showed that lowering of the deformation rate decreased the tendency toward recrystallization, and altered the grain boundary deviations from a dentate to a wave-like pattern. These results lead to new possibilities for applying high-temperature thermomechanical treatment in industry. Special investigations will be required, however, to find the effect

Card 2/3

L 9960-65

ACCESSION NR: AT4046864

of this structure on heat resistance.
Orig. art. has: 2 figures.

"The X-ray analysis was made by D.I. Gurfel".

ASSOCIATION: none

SUBMITTED: 16Jun64

ENCL: 00

SUB CODE: MM

NO REF SOV: 005

OTHER: 001

Card

3/3

L 17699-65 EWT(m)/EWP(w)/EWA(d)/EWP(k)/EWP(t)/EWP(b) Pf-L/Pad MJW/JD/HW

ACCESSION NR: AP4042041

S/0126/64/017/006/0845/0852

AUTHOR: Sadovskiy, V. D.; Sokolov, Ye. N.; Petrova, S. N.; Pavlov, V. A.; Gaydakov, M. G.; Noskova, N. I.; Kagan, D. Ya.

TITLE: The effects of high-temperature thermo-mechanical treatment on the heat resistance of KhN77TYuR alloy

SOURCE: Fizika metallov i metallovedeniye, v. 17, no. 6, 1964, 845-852

TOPIC TAGS: nickel alloy; chromium-containing alloy, aluminum containing alloy, creep rate, recrystallization, boron containing alloy, KhN77TYuR alloy, thermo mechanical treatment, heat resistance

ABSTRACT: The method of hot plastic deformation combined with quenching was used to enhance the stress-rupture strength of austenitic steels. The authors investigate the possibility of applying this combined method to KhN77TYuR, a ferritic-type alloy. Specimens 11.5 x 11.5 x 70 mm were annealed at 1080C for 8 hr. and rolled with a reduction of 25% at a rolling speed of 1.5 m/min. The process

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L 17699-65

ACCESSION NR: AP4042041

of recrystallization¹⁸ was suppressed by water cooling the specimens immediately after plastic deformation. All specimens were aged at 750C for 16 hr. Hardness was 285 HB. At 550C and under a stress of 90 kg/mm², the rupture life was extended from 4 to 100 hr while the creep rate decreased from $4-8 \times 10^{-2}\%$ to $8 \times 10^{-1}\%$ per hr. Above the 500-600C range a deterioration of strength characteristics was observed. The authors attribute the adverse effect of the combined method at 750C to the recrystallization during testing and to a possible higher rate of coagulation of the strengthening phase. The decrease in the creep rate and the increase of the rupture life were verified by x-ray method. The authors point out the formation of a polygonized substructure and to a boundary distortion in the form of characteristic serration during high-temperature deformation. They contend that the substructural boundaries impeded the travel of dislocations during creep, while the distortion of the grain boundaries lowered the susceptibility to intercrystalline failure. The authors suggest that the method of investigation may be insufficiently developed for an exhaustive interpretation of the results obtained and of the peculiarities of the structural state of the material. Orig. art. has: 5 figures.

Card 2/3

L 17699-65

ACCESSION NR: AP4042041

ASSOCIATION: Institut fiziki metallov AN SSSR (Institute of the
Physics of Metals AN SSSR)

SUBMITTED: 12Jul63

ENCL: 00

SUB CODE: MM

NO REF SOV: 012

OTHER: 008

Card 3/3

L 43859-65 EPF(c)/EPA(w)-2/EWA(c)/EWT(1)/EWT(m)/EWP(b)/T/EWP(t) Pr-4/Pab-10
 ACCESSION NR: AP4048765 IJP(c) S/0126/64/018/004/0502/0505
 WW/JD

44
 62
 B

AUTHOR: Krivoglaz, M. A.; Sadovskiy, V. D.

TITLE: Effect of strong magnetic fields on phase transformations

SOURCE: Fizika metallov i metallovedeniye, v. 18, no. 4, 1964, 502-505

TOPIC TAGS: phase transformation, magnetic field, martensite transformation, austenitic disintegration steel annealing

ABSTRACT: The authors investigated the effect of a strong magnetic field on the temperature of phase transformation of the first and second kind. The Clausius-Clapeyron equation is used for computing the effect of magnetic energy. The results are applied for the explanation of the experimentally observed strong effect of the magnetic field on the martensitic transformation in steels. It is pointed out that by similar methods, the processes of isothermal diffusion decomposition of undercooled austenite can be investigated, as can the decomposition of residual austenite in the annealing of hardened steel. Orig. art. has 1 figure and 5 equations.

Card 1/2

L 43859-65

ACCESSION NR: AP4048765

ASSOCIATION: Institut metallofiziki AN UkrSSR (Institute of the Physics of Metals AN Ukr SSR); Institut fiziki metallov AN SSSR (Institute of the Physics of Metals AN SSSR)

SUBMITTED: 06Jul64

ENCL: 00

SUB CODE: MM

NR REF SOV: 004

OTHER: 000

Card 2/2 CC

L 16619-65 EWT(m)/EWP(w)/EWA(d)/EWP(t)/EWP(k)/EWP(b) Pf-4 ASD(m)-3
 MJW/JD/HW
 ACCESSION NR: AP4048773 S/0126/64/018/004/0584/0589

AUTHOR: Sokolov, Ya. N.; Sadovskiy, V. D.

TITLE: Effect of high-temperature thermomechanical treatment on impact endurance of structural low-alloy steels

SOURCE: Fizika metallov i metallovedeniye, v. 18, no. 4, 1964, 584-589

TOPIC TAGS: low alloy structural steel, 30KhGSA steel, 20KhN4 steel, steel impact endurance, high temperature thermomechanical treatment, thermomechanical treatment

ABSTRACT: Low-alloy structural steels—30KhGSA and 20KhN4 (0.23% C, 0.6% Cr, 4.0% Ni, 0.5% Mn)—were subjected to high-temperature thermomechanical treatment (VTMO) and tested for endurance in repeated impact bending. The VTMO consisted in heating steel billets to 1200°C, furnace cooling to 900°C, rolling at this temperature with a 25—30% reduction, water quenching, and tempering at temperatures ranging from 200 to 650°C for 4—6 hr. In tests, the impact energy of 15 kg·cm was applied at a frequency of 600 per min. The test results showed that the VTMO increased the impact endurance of both steels

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L 16619-65

ACCESSION NR: AP4048773

2

(i.e., the number of impacts sustained to failure) by 2—3 times that of conventional heat treatment. The effect of VTMO depended on the tempering temperature. Tempering at 200—375C tripled the impact endurance, whereas tempering at 550—650C increased it only 1.5 times. Prolonging tempering at 550C to 8 hr had no additional effect on the impact endurance. Examination of the microstructure of fractured specimens showed that, regardless of the temperature of tempering, the VTMO promotes development of the "scraped" or "lapped" zone at the fracture surface, which is associated with a slow development of fatigue cracks. The VTMO also suppresses brittle intergranular failure in the zone of accelerated development of a crack. Higher impact endurance is also associated with the improved homogeneity of the structure, which probably is a determining factor in the effect of the VTMO. A higher hardness of the material resulting from such treatment also favorably affects the impact endurance. Orig. art. has: 5 figures.

ASSOCIATION: Institut fiziki metallov AN SSSR (Institute of the Physics of Metals, AN SSSR)

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L 16619-65
ACCESSION NR: AP4048773

SUBMITTED: 20Dec63

NO REF SOV: 012

ENCL: 00

OTHER: 000

0
SUB CODE: MM

ATD PRESS: 3147

Card 3/3

SADOVSKIY, V.D.

Magnetic field and phase transformations in steel. Metalloved.
i term. obr. met. no.7:16-18 JI '65. (MIRA 18:8)

1. Institut fiziki metallov AN SSSR.

SADOVSKIY, V.D. (Sverdlovsk)

Structural transformations during the heating of steel. Izv. AN
SSSR. Met. no.5:41-59 S-0 '65. (MIRA 18:10)

L 62542-65 EWP(z)/EWP(c)/EWP(m)/EWP(b)/T/EWA(d)/EWP(t) MJW/JD
 UR/0126/65/019/004/0592/0595
 669.112.227.34:538.69. 44
 32
 3

ACCESSION NR: AP5011754

AUTHOR: Fokina, Ye. A.; Smirnov, L. V.; Sadovskiy, V. D.

TITLE: Effect of a pulsed magnetic field on the temperature interval of martensitic transformation in steel

SOURCE: Fizika metallov i metallovedeniye, v. 19, no. 4, 1965, 592-595

TOPIC TAGS: martensitic transformation, steel, magnetic treatment 6

ABSTRACT: Several grades of steel were studied in an attempt to determine the effect which an applied pulsed magnetic field has on the position of the martensitic transformation temperature range. The chemical compositions of the steels studied are given in table 1 of the Enclosure. The magnetometric method was used to determine the martensite points and the quantity of ferromagnetic phase. The amplitude of the field was 400,000 oersteds at a frequency of 5 kc. It was found that the temperature of martensitic transformation in steels and iron-base carbon-free alloys is shifted toward the higher temperature side under the action of a pulsed magnetic field. The amount of this shift at a given supercooling value increases with

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L 62542-65

ACCESSION NR: AP5011754

the field strength as does the degree of transformation. In some cases, a strong field causes additional dissociation of residual austenite, however this effect is small and can hardly have any practical significance. "The authors express their gratitude to I. G. Fakindov and E. A. Zavadskiy for help in carrying out the experiments where superstrong pulsed magnetic fields were used." Orig. art. has: 4 figures, 2 tables.

ASSOCIATION: Institut fiziki metallov AN SSSR (Institute of Physics of Metals, AN SSSR)

SUBMITTED: 16Jul64

ENCL: 01

SUB CODE: MM, EM

NO REF SOV: 004

OTHER: 000

Card 2/3

L 62542-65

ACCESSION NR: AP5011754

ENCLOSURE: 01

9

TABLE 1

Grade of steel	Chemical Composition, %						
	C	Ni	Cr	Mn	Si	Mo	V
50Kh2N22	0.49	21.9	2.04	0.26	0.63	-	-
50KhN23	0.52	22.8	1.49	0.19	0.30	-	-
50Kh2N16	0.52	16.44	2.01	0.47	0.63	-	-
50Kh2N3	0.51	3.21	2.00	0.35	0.11	-	-
25N24M2	0.21	24.10	-	0.22	0.06	2.16	-
N30	0.06	29.72	-	0.15	-	-	-
Kh12F	1.35	-	12.3	0.19	-	-	0.92
ShKh15	1.09	-	1.37	0.30	0.26	-	-
U12	1.25	-	0.2	0.33	0.26	-	-

Card 3/3

L 56075-65 EWT(d)/EWT(m)/EWP(w)/EWA(d)/T/EWP(t)/EWP(k)/EWP(z)/EWP(b)/EWA(c)
 Pf-4/Pad IJP(c) MJW/JD/HW/JG/EM

ACCESSION NR: AP5013810

UR/0126/65/019/005/0722/0725
 669.112.227.34 : 538.69

60
 54
 B

AUTHOR: Fokina, Ye. A.; Smirnov, L. V.; Sadovskiy, V. D.

TITLE: Destabilization of austenite by a powerful pulsed magnetic field

SOURCE: Fizika metallov i metallovedeniye, v. 19, no. 5, 1965, 722-725

TOPIC TAGS: destabilized austenite, stabilized austenite, martensite transformation, pulsed magnetic field, plastic deformation, supercooled austenite, kinetic maximum

26

ABSTRACT: The authors investigated the effect of a pulsed magnetic field on: austenite stabilized by plastic deformation in 50Kh2N22 steel (0.49% C, 21.9% Ni, 2.04% Cr, 0.26% Mn, 0.63% Si); austenite stabilized by isothermal exposure to temperatures above the martensite point in N14Kh10 steel (0.05% C, 13.73% Ni, 9.70% Cr, 0.33% Mn, 0.48% Si); martensite transformation in austenite supercooled to the temperature range below the kinetic maximum in N24G4 steel (0.03% C, 23.6% Ni, 3.6% Mn) (0 to -196°C). The amount of martensite in the specimens was controlled by the magnetometric method.

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L 56075-65

ACCESSION NR: AP5013810

The pulsed magnetization of the specimens was accomplished in an installation for generating superpowerful pulsed magnetic fields, described by Fakidov and Zavadskiy (Fizika metallov i metallovedeniye, 1958, 6, 569). The field amplitude in the experiments reached 500 k-oersteds and the frequency, approximately 5000 cps. It was established that the application of the pulsed magnetic field in all cases leads to the destabilization of austenite, the degree of martensite transformation being then a function of the intensity of the field applied. The increase in the degree of plastic deformation leads to an increase in the magnitude of the threshold field. The pulsed magnetic field destabilizes austenite following the latter's thermal stabilization. In alloys with isothermal martensite transformation, supercooled to a temperature range below the kinetic maximum (to the temperature of liquid nitrogen) the pulsed magnetic field induces a martensite transformation, the degree of this transformation also being a function of the intensity of the field applied. "The authors consider it their pleasant duty to express their appreciation to I.G. Fakidov and E. A. Zavadskiy for technical assistance in conducting the experiments employing superpowerful pulsed magnetic fields, and to N. A. Borodina and E. I. Estrin for their kindness in providing alloy specimens."

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L 56075-65

2

ACCESSION NR: AP5013810

Orig. art. has: 4 figures, 1 table.

ASSOCIATION: Institut fiziki metallov AN SSSR (Institute of Metal Physics,
AN SSSR)

SUBMITTED: 28Jul64

ENCL: 00

SUB CODE: MM, EM

NO REF SOV: 007

OTHER: 000

Heat Treatment

Card

bab
3/3

L 4186-66 EWT(m)/EPF(c)/EWA(d)/T/EWP(t)/EWP(z)/EWP(b)/EWA(c) IJP(c)

ACCESSION NR: AP5016535 MJW/JD UR/0126/65/019/006/0932/0933

8/

72

B

AUTHOR: Fokina, Ye. A.; Smirnov, L. V.; Sadovskiy, V. D.; Prekul, A. F.

44.55

44.55

44.55

44.55

TITLE: On the problem of the effect of a constant magnetic field on the martensite transformation in steel

4,44.55

SOURCE: Fizika metallov i metallovedeniye, v. 19, no. 6, 1965, 932-933

TOPIC TAGS: martensitic transformation, constant magnetic field, strong magnetic field, liquid helium, steel

27

ABSTRACT: At the Institute of Physics of Metals experiments were performed on 50KhN23 steel in a slowly increasing then constant (for 6 min) magnetic field of 40 kOe in a solenoid with a superconducting winding at liquid helium temperature. Without the magnetic field, this steel does not undergo a martensite transformation on cooling to -196°C, but cooling to the liquid helium temperature causes the formation of 8-9% martensite. When the field was applied, an additional 12% martensite was formed. Similar experiments with the same steel carried out at the Physics Institute gave analogous results. In another steel, 50Kh2N22, in which no martensite is formed on cooling in liquid helium, the application of a constant magnetic

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L 4186-66

ACCESSION NR: AP5016535

field of 43.5 kOe caused the formation of 8% martensite. It is concluded that the action of the magnetic field on the martensite transformation should not be attributed to the influence of the mechanical forces arising during pulsed magnetization, since the field used was constant, not pulsed. "The authors thank N. V. Volkenshteyn and V. R. Karasik for affording them the opportunity to carry out the experiments." ^{44, 55}

ASSOCIATION: Institut fiziki metallov AN SSSR (Institute of Physics of Metals, AN SSSR)

SUBMITTED: 26Feb65

ENCL: 00

SUB CODE: MM

NO REF SOV: 004

OTHER: 000

Card 2/2 *md*

ZEL'DOVICH, V.I.; SADOVSKIY, V.D.

Effect of heat treatment on the magnetic properties of certain alloys in the systems Fe - Mn and Fe - Ni. Fiz. met. i metalloved, 20 no.3:406-411 S '65.

(MIRA 18:11)

1. Institut fiziki metallov AN SSSR.

ROMANOV, Ye.P.; SMIRNOV, L.V.; SADOVSKIY, V.D.; VOLKENSHTEYN, N.V.

Critical current of a disperse superconducting phase obtained during aging. Fiz. met. i metalloved. 20 no.3:455-458 S '65.
(MIRA 18:11)

1. Institut fiziki metallov AN SSSR.

L 18730-66 EWT(1)/EWT(m)/EWA(d)/EWP(t) IJP(c) JD/GG

ACC NR: AP6005132

SOURCE CODE: UR/0126/66/021/001/0017/0020

AUTHOR: Romanov, Ye. P.; Sadovskiy, V. D.; Volkenshteyn, N. V.; Smirnov, L. V.

ORG: Institute of the Physics of Metals, AN SSSR (Institut fiziki metallov)

TITLE: Disruption of superconductivity in an alloy with a disperse superconducting phase

SOURCE: Fizika metallov i metallovedeniye, v. 21, no. 1, 1966, 17-20

TOPIC TAGS: superconductivity, zirconium alloy, magnetic field, solenoid

ABSTRACT: This is a continuation of a previous investigation (Romanov et al. FMM, 1965, 20, 3) with the difference that it presents certain findings on the disruption of superconductivity in the alloy of Zr^{27} with $4\% Nb^{55}$ by weight following the decomposition of supersaturated solid solution in a longitudinal magnetic field generated by means of a superconducting solenoid at $4.2^{\circ}K$. The current was introduced at a smoothly increasing rate into the specimens by means of a semiconductor amplifier and the disruption of superconductivity was recorded by means of an automatic-recording millivoltmeter. It is found that for the alloy investigated the transition from superconducting to normal state is abrupt in the absence of the magnetic field and increasingly smooth the greater is the intensity of the magnetic field applied. Plotting of the curves of electric resistance as a function of the current introduced (Fig. 1) revealed that

Card 1/3

UDC: 539.292:537.312.62

L 18730-66

ACC NR: AP6005132

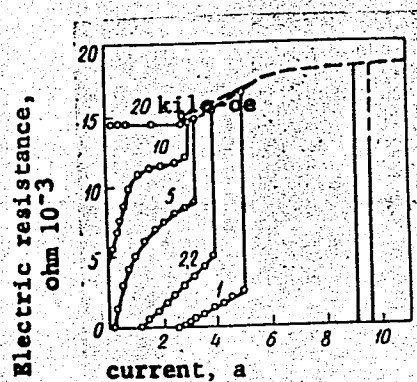


Fig. 1. Resistance as a function of the magnitude of the current introduced in a longitudinal magnetic field, for the alloy Zr + 4% Nb. Deformation 82%, tempering 550°C for 4 hr.

Card 2/3

L 18730-66

ACC NR: AP6005132

the disruption of superconductivity occurs over a wide range of the values of the current and magnetic field. Apparently, various sectors of the superconducting circuit differ in the dependence of their critical current on the intensity of the magnetic field. Electric resistance increases with increasing magnetic-field intensity. On the whole, the character of the transition curves indicates that, in the alloy investigated, disruption of superconductivity by current in a longitudinal magnetic field occurs gradually owing to the successive elimination of the superconducting state of individual sectors of the superconducting circuit. Although specimens in fields of the order of 20 kilo-oersteds become markedly heated, some of their sectors still remain in superconducting state. "The authors are indebted to A. Prekul for affording them the opportunity of performing the measurements with the aid of a superconducting solenoid." Orig. art. has: 3 figures.

SUB CODE: 11, 14, 20/ SUBM DATE: 28Jul65/ ORIG REF: 001/ OTH REF: 008

Card 3/3 *SNV*

L 46282-66 ENT(m)/ENT(w)/T/ENT(t)/ETI IJP(c) JD/HW

ACC NR: AP5025326

SOURCE CODE: UR/0126/65/020/003/0406/0411

AUTHOR: Zel'dovich, V. I.; Sadoyskiy, V. D.

ORG: Institute of Physics of Metals, AN SSSR (Institut fiziki metallov AN SSSR)

TITLE: The effect of heat treatment on the magnetic properties of some Fe-Mn and Fe-Ni alloys

SOURCE: Fizika metallov i metallovedeniye, v. 20, no. 3, 1965, 403-411

TOPIC TAGS: ferrous alloy, nickel containing alloy, manganese containing alloy, ~~metal heat treatment~~, metal phase system, phase transition, ANNEALING, MAGNETIC SATURATION, MAGNETIC COERCIVE FORCE

ABSTRACT: The effect of annealing temperatures on the magnetic saturation intensity and coercive force of tempered and stressed ferrous alloys was studied. The samples, containing 0.5-10.6 wt% Mn, 0.1-31.8 wt% Ni, and 0.05 wt% C and 0.15-0.35 wt% Si, were tempered 30 min at 1180C, quenched in water, and annealed at temperatures to 720C in a salt bath. During annealing at temperatures corresponding to $\alpha\gamma$ transitions a high dispersion of magnetic martensite and nonmagnetic austenite is formed. Magnetic saturation intensity reaches a minimum and the coercive force a maximum, due to the appearance of an Mn- or an Ni-enriched austenite phase which is stable to $\alpha\gamma$ transitions close to room temperature.

Card 1/2

UDC: 539.292:536:538

L 46282-66

ACC NR: AP5025328

Deformation of the tempered Fe-Ni samples by rolling at room temperature prior to annealing caused a sharper decrease and increase of magnetic saturation and coercive force, respectively, during annealing at temperatures of $\alpha\gamma$ transition. For the alloy of 31.8 wt% Ni content, a decrease of magnetic saturation intensity but no essential increase of the coercive force was observed at $\alpha\gamma$ transition temperatures; a peak of the latter parameter appeared at 250C and on approach to the Curie point of the ferromagnetic austenite phase of this alloy. Orig. art. has: 5 figures and 1 table.

SUB CODE: 11,20/ SUBM DATE: 18Jan65 / ORIG REF: 006/ OTH REF: 001

LS
Card 2/2

L 26646-66 EWT(m)/EPF(n)-2/T/EWP(t) IJP(c) JD/WW/JG

ACC NR: AP5025333

SOURCE CODE: UR/0126/65/020/003/0455/0458

AUTHOR: Romanov, Ye. P.; Smirnov, L. V.; Sadovskiy, V. D.; Volkenshteyn, N. V.

ORG: Institute of Metal Physics, AN SSSR (Institut fiziki metallov AN SSSR)

TITLE: Critical current of the superconductive dispersion phase obtained during aging

SOURCE: Fizika metallov i metallovedeniye, v. 20, no. 3, 1965, 455-458

TOPIC TAGS: martensitic transformation, zirconium base alloy, niobium containing alloy, superconductivity, metal aging, solid solution, plastic deformation, metal heat treatment, current density

ABSTRACT: A nonsuperconductive alloy at 4.2°K was used which could separate a superconductive dispersion phase during the process of thermal treatment or aging. The alloy used was zirconium with 4% niobium. After preparation, superconductivity was obtained even after short thermal treatment at a temperature of 500°C. Maximum critical density is obtained after heating the sample for 2½ hours. Further heating results in a decrease of critical current density. When heating the zirconium-4% niobium alloy a supersaturated niobium α -solid solution is obtained from the stable β -solid solution as a result of martensite transformation.

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UDC: 537.312.62

L 26646-66

ACC NR: AP5025333

Plastic deformation increases considerably the density of lattice defects, and correspondingly increases the density of separations. It can be assumed that because of the above phenomena, increase of critical current density is observed with increase of the degree of cold deformation. The appearance of superconductivity in the alloy is explained only by the separated phase which is independent of the matrix properties. It can be noted that even a slight phase separation will result in a considerable increase of current density. Orig. art. has: 5 fig.

SUB CODE: 11,20 SUBM DATE: 19Mar65/ ORIG REF: 004/ OTH REF: 008

Card 2/2

ACC NR: AR6027503

SOURCE CODE: UR/0137/66/000/004/I019/I019

AUTHOR: Belenkova, M. M.; Mikheyev, M. N.; Malyshev, K. A.; Sadovskiy, V. D.;
Ustyugov, P. A.

TITLE: Phase transformations during the deformation and tempering of austenitic steel

SOURCE: Ref. zh. Metallurgiya, Abs. 41127

REF SOURCE: [Tr.] In-ta fiz. metallov. AN SSSR, vyp. 24, 1965, 54-58

TOPIC TAGS: metal deformation, austenite steel, martensitic transformation, grain size, magnetic susceptibility

TRANSLATION: A study was made of the magnetic, electrical and mechanical properties of 60Kh31S8V austenitic band steel subjected to deformations of 10, 25, 31, and 43% after quenching from 1050°C. For the same deformation conditions, a fuller decomposition of austenite occurred in large-grained samples as a result of the variation of the position of the martensitic point for a change of grain size (the point of the initial martensitic transformation of large-grained samples was located higher than fine-grained). Under the effect of deformation in the steel, a much greater amount of α' -phase formed than during tempering. A definite correlation was found between the nature of the magnetic and electrical property changes on the one hand and the mechanical properties on the other, as a function of tempering temperature. Thus, a drop in σ_b

UDC: 669.15'26'74'24.781.017.3:621.785.78

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ACC NR: AR6027503

and σ_s of samples deformed at 20°C was found beginning at 400-450°C; at these same temperatures the lowering of electrical resistivity was initiated. Magnetic susceptibility increased after 500°C, while ψ and a_k decreased. It was concluded that the changes in mechanical properties were caused by processes associated with the formation of α -phase during cold deformation. During tempering of the deformed samples, the α -phase of the original deformation is dissolved and some quantities of the ferromagnetic phase appear in separate portions owing to carbide formation. I. Tulupova.

SUB CODE: 11,13

Card 2/2

ACC NR: AT6034463

(A)

SOURCE CODE: UR/0000/66/000/000/0265/0271

AUTHOR: Surkov, Yu. P.; Sadovskiy, V. D.; Sokolov, Ye. N.; Pavlov, V. A.;
Gaydukov, M. G.

ORG: none

TITLE: Effect of high temperature thermomechanical treatment at a small deformation rate on the heat resistance of Type KhN77YuR alloy

SOURCE: AN SSSR. Institut metallurgii. Svoystva i primeneniye zharoprochnykh splavov (Properties and application of heat resistant alloys). Moscow, Izd-vo Nauka, 1966, 265-271

TOPIC TAGS: metal heat treatment, heat resistance, metal deformation, metal recrystallization

ABSTRACT: High temperature thermomechanical treatment, concluding with deformation of the material at increased temperatures, and then cooling, eliminating the development of recrystallization due to the birth and growth of new grains, leads to a considerable improvement in the heat resistance properties of steels and alloys. The present article considers the effect of high temperature thermomechanical treatment at a small deformation rate ($0.003-0.004 \text{ sec}^{-1}$) on the heat resistance of alloy KhN77TYuR. Samples with a size of 50 x 50 x 75 mm were heated to a temperature of

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ACC NR: AT6034463

1080° with a holding time of 8 hours, after which part of them were cooled in air (control samples), while the other part was subjected at the same temperature to 25-30% deformation. On the basis of the experimental results, the following conclusions were drawn: 1) high temperature thermomechanical treatment of alloy K_hN77TYuR with a deformation rate of 0.003-0.005 sec⁻¹ assures a recrystallization structure in a cross section of the order of 50 x 50 mm, and leads to an improvement in heat resistance properties; 2) fragmentation of the structure in the alloy assures greater stability, and increases the temperature of articles made from the alloy by the method of high temperature thermomechanical treatment (up to 850°). Orig. art. has: 3 figures and 1 table.

SUB CODE: 11/ SUBM DATE: 10Jun66/ ORIG REF: 005

Card 2/2

L 10448-67 EWT(1)/EWT(m)/EWP(w)/EWP(t)/ETI IJP(c) JD/HW

ACC NR: AP6023699

SOURCE CODE: UR/0126/66/021/004/0541/0545

AUTHORS: Zel'dovich, V. I.; Sadovskiy, V. D.

23
22

ORG: Institute of Physics, AN SSSR (Institut fiziki AN SSSR)

TITLE: Temperature dependence of the magnetic properties of iron-nickel alloys

SOURCE: Fizika metallov i metallovedeniye, v. 21, no. 4, 1966, 541-545

TOPIC TAGS: iron alloy, nickel alloy, magnetic metal, magnetization, magnetization curve

ABSTRACT: The temperature dependence of the magnetic saturation, magnetization, and coercivity of iron-nickel alloys containing 27.9% Ni and 27.0% Ni plus 1.9% Ti respectively was studied. The study supplements the results of V. I. Zel'dovich and V. D. Sadovskiy (FMM, 1965, 20, 416). The experimental procedure followed is described in the reference above, and the experimental results are summarized in graphs and tables (see Fig. 1). It was found that, as a result of annealing, the austenite phase becomes enriched with nickel to the extent that the specimen acquires ferromagnetic properties at 20C. It is concluded that the chief difference in the coercivity of Fe-Ni and Fe-Mn alloys is due to the ferromagnetism of the austenite component of the former.

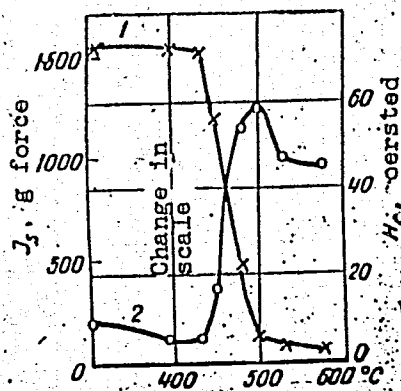
Card 1/2

UDC: 669.15:538.24

L 10448-67

ACC NR: AP6023699

Fig. 1. The dependence of the magnetization (1) and coercivity (2) of an iron-nickel alloy on the annealing temperature.



Orig. art. has: 1 table and 6 graphs.

SUB CODE: 11/ SUBM DATE: 08Jun65/ ORIG REF: 009/ OTH REF: 003

magnetic alloy

Card 2/2

ACC NR: AP7002739

(N)

SOURCE CODE: UR/0126/66/022/006/0890/0895

AUTHOR: Zel'dovich, V. I.; Sadoyskiy, V. D.; Sorokin, I. P.

ORG: Institute of Metal Physics, AN SSSR (Institut fiziki metallov AN SSSR)

TITLE: Dilatometric anomalies in textured alloys during $\alpha \rightarrow \gamma$ transformation

SOURCE: Fizika metallov i metallovedeniye, v. 22, no. 6, 1966, 890-895

TOPIC TAGS: dilatometric anomaly, ferronickel alloy, ferromanganese alloy, austenite transformation, martensitic transformation / N12 ferronickel alloy, N15 ferronickel alloy, N23 ferronickel alloy, N28 ferronickel alloy, N32 ferronickel alloy, N27T2 Fe-Ni-Ti alloy, G7 ferromanganese alloy, G14 ferromanganese alloy

ABSTRACT: In textured Fe-Ni alloy the change in volume during $\alpha \rightarrow \gamma$ transformation of the martensitic type occurs nonisotropically. In particular, the transformation is accompanied by elongation of the alloy in the direction of the axis of texture although the specific volume of the γ -phase is smaller than that of the α -phase. In a statistically isotropic alloy the extent of the dilatometric (linear) effect during transformation reaches one-third of the volume effect; the same ratio exists between the linear and volume effects of transformation in an anisotropic material if the phase transition occurs in a crystallographically disordered manner. Any

Card 1/3

UDC: 669.15:[539.37 + 536

ACC NR: AP7002739

deviation from this ratio is termed a dilatometric anomaly (Zel'dovich, V. I., Sorokin, I. P. FMM, 1966, 21, 223). The difference between the dilatometric effect of the transformation of a textured (deformed) alloy versus that of a statistically isotropic (nondeformed) alloy represents the measure of the dilatometric anomaly, on taking into account the amount of the transforming phase. In this connection, on the basis of an analysis of dilatometric anomalies and changes in texture due to $\alpha \rightarrow \gamma$ transformation, as well as on the basis of the change in transformation temperature owing to prior plastic deformation (92% reduction in area), the nature of $\alpha \rightarrow \gamma$ transformation during continuous heating is discussed with respect to N23, N28, N32 and N27T2 ferronickel alloys and G7 and G14 ferromanganese alloys. The temperatures at the beginning and end of the transformation were taken as the temperatures at which the dilatometric curve began to markedly deviate from its rectilinear course. The dilatometric curves were plotted with the aid of a differential optical dilatometer, and the phase composition was determined by the magnetometric method. Findings: in ferronickel alloys with a low Ni content -- N12 (12.0% Ni), N15 (15.1% Ni), N23 (23.1% Ni) -- the decisive role in transformation is played by diffusion processes (the austenite texture becomes dispersed to a much greater extent), whereas in the alloys with a higher Ni content the martensitic mechanism is largely responsible for this transformation. The addition of Ti (1.9%) to the alloy with 27% Ni (N27T2) inhibits the recrystallization of austenite and the development of disordered diffusion processes during transformation. This may be a definite factor in enhancing the strength of Fe-Ni-Ti alloys

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ACC NR: AP7002739

owing to phase strain hardening compared with Fe-Ni alloys. In ferromanganese alloys the initial temperature of $\alpha \rightarrow \gamma$ transformation markedly decreases under the influence of deformation, which points to a diffusion mechanism of $\alpha \rightarrow \gamma$ transformation in these alloys during their continuous heating. Orig. art. has: 2 tables, 2 figures.

SUB CODE: 13, 20/ SUBM DATE: 20Apr66/ ORIG REF: 007/ OTH REF: 002

Card 3/3

SADOVSKIY, Valentin Georgiyevich, inzhener-polkovnik, kandidat tekhnicheskikh nauk, dotsent; GALIYENKO, S.G., gvardii polkovnik, redaktor; KONOVALOVA, Ye.K., tekhnicheskiiy redaktor

[Principles of the construction of artillery materiel] Osnovaniia ustroistva material'noi chastii artillerii. Moskva, Voen. izd-vo Ministerstva obor. SSSR, 1956. 498 p. (MLRA 9:11)
(Artiller, Field and mountain)
(Ordnance)

SADOVSKIY, V.I.

Principles of the technological and operational design of assembly-line construction with the aid of electronic computers. Vych. i org.tekh. v stroi. i proekt, no.3:2-9 '64.

(MIRA 18:10)

1. Nauchno-issledovatel'skiy institut stroitel'nogo proizvodstva Gosstroya UkrSSR,

SADOVSKIY, Y.N.

PHASE I BOOK EXPLOITATION

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Leningrad. Tsentral'nyy institut prognozov

Voprosy sinopticheskoy meteorologii (Problems in Synoptical Meteorology) Moscow, Gidrometeoizdat, Moskovskoye otdelniye, 1957. 129 p. (Its: Trudy, vyp. 61) 1,300 copies printed.

Ed. (title page): Uspenskiy, B.D.; Ed. (inside book): Sadovskiy, V.N.; Tech. Ed.: Zarkh, I.M.

PURPOSE: The collection of articles is intended for specialists working in the field of weather forecasting.

COVERAGE: The collection discusses the relationship between atmospheric pressure and weather forecasting.

TABLE OF CONTENTS:

Vetlov, I.P. Analysis of Conditions of the Development of Cyclones and Anticyclones Near the Earth's Surface 3

The article examines a series of problems which might possibly offer some explanation as to the evolution of cyclones and

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and anticyclones; these problems are still unsolved, despite the abundance of theoretical and empirical data. One of these problems is the effect of thermobaric field structures on the origin of the cyclone and anticyclone, and also on the process of cooling and warming air by advection. The author analyzes the results of 110 observed cyclones and 82 anticyclones and discusses: (1) The geostrophic wind velocity along the isobaric levels of 700, 500, and 300 millibars and the horizontal temperature gradients at the 500 millibar level in the area of cyclones and anticyclones over the central, cold, and warm sections; (2) the advection of vortices at 700, 500, and 300 mb isobaric levels and advective changes of temperature in the 500-1000 mb layers over the central section of cyclones and anticyclones; (3) the changes in the turbulent air movement and their dependence on elevation in the near-surface layer of the cyclonic area; (4) the changes in the mean temperature at 500-1000, 300-500, and 200-300 mb levels in the process of development of cyclones and anticyclones; and finally (5) the changes in baric pressures observed during a 12-hour interval. All the points considered may facilitate forecasting.

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There are 15 tables, 3 drawings, and 8 Soviet references.

Tomashevich, L.M. Cyclone Regeneration and the Effects of Vertical Currents on Thermobaric Field

56

The author analyzes the process and the effect of the penetration of air masses, mostly of cold air, into a cyclone area; such an injection (intrusion) represents a new source of energy capable of reviving a dying cyclone. The regeneration of a cyclone is linked with the deepening of the cyclone area; new fronts are created, the upward movement is intensified, the former direction of the cyclone movement is changed, and the precipitation is increased. Since a regenerated cyclone causes considerable shift in the prevailing weather conditions, these conditions can be predicted from some of the symptoms of the regeneration occurring. The author explains the nature of the regenerated cyclone and describes the principal changes which occur at 700 (absolute topography at 700 millibar level). The explanation is theoretical

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and is based on the selected coefficients of vorticity; in this connection, reference is made to V.A. Bugayev who worked out a mathematical solution of the problem of vorticity. Statistical data are derived from observations conducted between 1947 and 1951. Two pages of the author's own conclusions contain data on the distribution of velocities for primary and regenerated cyclones in various stages of their development and on the accompanying temperature behavior. The essential indications for the regeneration of a cyclone are given. There are 11 drawings, 5 tables, and 8 Soviet references.

Leonov, N.G. Cyclone Displacements Due to the Structure of the Baric Field in the Atmosphere

82

The author examines the rule of the leading jet in predicting the possible direction of a cyclone. This rule implies that cyclones move at 700-500 millibar levels with the direction of the wind above the cyclone area. However, since information on such winds is difficult to obtain, the author discusses and evaluates the possibility of using the data on the geostrophic

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wind present over cyclonic areas. The author arrives at the conclusion that displacements of cyclones are affected by factors other than the winds alone. There are 29 tables, 3 figures, and no references.

Shishkova, I.A. Methods of Calculating Local Accelerations

111

The author reviews the problem of deviation of local winds from the geostrophic wind and offers an empirical rule for determining the direction of any such deviation through an analysis of local accelerations. Of particular importance in such cases is whether or not the wind in question deviates toward a low pressure or a high pressure area and at what velocity it moves. The mathematical solution, suggested by the author, results in 76-78 percent correct predictions as to the direction of the wind. The author concludes that no connection exists between variations in the velocity of the wind and the direction it takes. An increase (or decrease) in wind intensity within 12 hours can occur with deviations toward either the high or low pressure areas. There are 2 figures and 3 Soviet references.

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Glazova, O.P. Determination of Maximum Daily Air Temperature
by Vertical Sounding of the Atmosphere

120

The author recapitulates the standard method of evaluating the radiation balance for the interval of time between sunrise and the moment of maximum daily temperature, including the determination of the latter. Reference is made to the efforts of N.I. Bel'skiy and Ye. Gol'd which were directed to this end. The American meteorologist T. Williams is also mentioned in this connection, but his technique is rejected as not applicable to conditions in the European USSR. Bel'skiy's version is accepted by the author and explained in detail. Elaborating on Bel'skiy's method, the author of the article considers the following meteorological factors essential for the determination of maximum temperature: the flow of solar radiation, the dynamic turbulence, and the horizontal displacement of the air caused by the temperature gradient. The mathematical method reduces to defining the value of what is called by the author "an elementary square," a quadrangle enclosed between isobars with a 10 mb spread and isotherms 1° apart. This area

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corresponds to the amount of heat (2.45 calories) required to raise the temperature of an air column 1°C , the column having a cross section of 1 cm^2 and a height corresponding to a pressure difference of 10 mb. The weight of the air column is 10.2 grams and its specific heat 0.24. The article examines also the role of dynamic turbulence in changing the air temperature in the near-surface layer (i.e. 300-400 meters), when there is no advection. There are 3 tables, 3 figures, and 6 references, of which 4 are Soviet and 2 English.

AVAILABLE: Library of Congress

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6-23-58

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SADOVSKIY, V.N.
PAGAVA, S.T.; ARISTOV, N.A.; BLYUMINA, L.I.; ZAKHAROVA, N.M.; SEVAIKINA, N.A.;
SAGATOVSKIY N.V., otvetstvennyy red.; SADOVSKIY, V.N., red.; ZEMTSOVA,
T.Ye., tekhn. red.

[Influence of the North Atlantic on the development of the synoptic
processes] Vliianie Severnoi Atlantiki na razvitie sinopticheskikh
protssessov. Otv. red. N.V. Sagatovskii. Moskva, Gidrometeor. izd-vo
(otd-nei), 1958. 70 p. (MIRA 11:7)
(Atlantic Ocean) (Climatology)

SOPACH, E.D.; BLINOV, L.K., red.; PERLOVSKAYA, A.D., red.; SADOVSKIY, V.N.,
red.; ZARKH, I.M., tekhn. red.

[Electric conductivity as a means of measuring the salinity of sea
water] Elektroprovodnost' kak metod opredeleniia solenosti morskikh
vod. Pod red. L.K. Blinova. Moskva, Gidrometeor. izd-vo, 1958.
138 p. (MIRA 11:8)

(Sea water)

SIMONOV, Anatoliy Il'ich; AKSENOV, A.A., red.; SADOVSKIY, V.N., red.;
ZARKH, I.M., tekhn. red.

[Hydrology of the mouth of the Kuban River] Gidrologiia ust'voi
oblasti Kubani. Pod red. A.A. Aksenova. Moskva, Gidrometeor.
izd-vo, 1958. 139 p. (MIRA 11:9)

(Kuban River—Hydrology)

KERBABAYEV, E.B.; TUROV, I.S.; SADOVSKIY, V.N.; MOLOCHEK, G.I.; KARAPETYAN, A.B.; BABAYANTS, G.A.

Use of aerosols in fighting carriers of cutaneous leishmaniasis.
Zdrav. Turk. 6 no.1:29-31 Ja-F '62. (MIRA 15:4)

1. Iz Tsentral'nogo nauchno-issledovatel'skogo dezinfektsionnogo instituta (dir. - prof. V.I. Vashkov) i Ashkhabadskogo instituta epidemiologii i gigieny (dir. - dotsent Ye.S. Popova).
(DELHI BOIL) (MOTH FLIES--EXTERMINATION)
(SPRAYING AND DUSTING)

SADOVSKIY, V. S., CHUPRAKOWA, N. P.

The Effect of Heat-Treatment on the Quantity of Residual Austenite and
its Disintegration in the Tempering of Chrome-Nickel Structural Steels.

Trudy UFAN 10, 119, 1941.

SADOVSKIY, V. S.

U.S.S.R.

5725 AECL-181
CALCULATION OF THE ELECTRON-OPTICAL PARAMETERS OF THE β -SPECTROMETER WITH DOUBLE FOCUSSED OF THE ELECTRON BEAM. A. V. Zolotarev and V. S. Sadovsky. Translated from Izvest. Akad. Nauk S.S.S.R. Ser. Fiz. 18, 215-26 (1954). 27p.

62
①

SADOVSKIY, V. Ye.

*Influence of several processes of heat-treatment on the tendency to delayed fracture of steels with tensile strengths of 120-140 kg/mm². L. M. Pevner, V. B. Sidorovskii, T. K. Zilova, S. S. Volkov, and Ya. M. Potak. *Metallurg. Obrabotka Metallov* 1956, No. 3, 5-14. An exptl. study was made of the effect of stress and H on delayed fracture in steel 30KhGSA (0.3% C, 1.0 Mn, 1.0 Si, 1.0 Cr, 0.4 Ni). Plates 2 X 8 X 10 mm. were bent various amts. in the elastic or elastoplastic range and were made the cathode in a 5% NaHSO₃ soln. for 30 min. The max. amt. of bending for which no cracking occurred was tabulated. Hardness in the range 37-40 R_c was produced by a variety of heat treatments. The surface layer was important in detg. the exptl. behavior. For specimens that had been given the same hardening treatment, tempering in a nondeoxidized salt bath gave a value of more than 6 mm. of bending while tempering in a muffle furnace gave about 2 mm. Fresh salt baths also gave about 2 mm., although well used, deoxidized baths gave values comparable to nondeoxidized baths. The fresh baths produced a surface layer contg. 0.0271 g. N compared to 0.0014 for used baths. When the fresh bath was used at 410° it gave more than 6 mm. of bend because the nitriding process was almost absent. Heating in a muffle furnace, either for hardening or for tempering, gave a low bend value because of the oxide layer produced. Isothermal quenching in salt baths at 390-410° gave the best results. There was considerable variation among heats of steel. Polishing the surface after heat-treatment lowered the bend value in many cases; for isothermal quenching the lowering was from more than 6 mm. down to 2. The above*

Pervner, L. M., Sadovskii, V. E.

results were confirmed by further tests on pickling and zincification of plates. When zincified bolts were tested, it was found that there was little tendency toward delayed fracture if the bolts were tightened in flat plates. Therefore, plates with an 8° bend were used, and the bolts were tightened in stages, with a period of 2 or 3 days allowed for delayed fracture to occur at each stage. The results were in agreement with those above except that specimens heated in a muffle furnace were satisfactory, probably because the oxide layer was removed by the pickling operation preceding zincification. Microhardness tests of bolts that had failed in service showed that the surface layer to a depth of about 80 μ had a hardness of about 800 kg./sq. mm. compared to a core hardness of 400.

A. G. Guy

2/2

of g/m

SADOVSKIY, V. Ye.

AUTHOR: Zilova, T.K., Candidate of Technical Sciences, and Sadovskiy, V.Ye. and Demina, N.I., Engineers. 129 - 8 - 1/16

TITLE: Influence of the surface state on the tendency of steel 30XrCA to slow failures. (Vliyanie sostoyaniya poverkhnosti na sklonnost stali 30 KhGSA k zamedlennomu razrusheniyu.)

PERIODICAL: "Metallovedeniye i Obrabotka Metallov" (Metallurgy and Metal Treatment), 1957, No.8, pp.2-7 (U.S.S.R.)

ABSTRACT: On investigating slow failures of bolts and nuts made of steel 30XrCA (ultimate strength 120 kg/mm²), thin hardened layers were frequently observed directly at the surface and these appeared to be one of the causes of failure of such components. Investigation of the heat treatment and of the heating baths revealed that there was a possibility of surface hardening to be produced during the normal heat treatment, but it was not possible to reproduce in these experiments the brittle layers which were detected in bolts and nuts of current manufacture. In this paper the results are given of further study of the influence of the conditions of heat treatment and shaping on the surface state and the mechanical properties of the above mentioned steel. The experiments were carried out with plates of 2 x 8 x 100 mm and pins of 12 mm dia. produced from rods of 16 mm of a single melt and, also, on boards of 10 mm dia.

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Influence of the surface state on the tendency of steel
30XCA to slow failures. (Cont.) 129 - 8 - 1/16

during heating in the process of hardening, reaches, after tempering, a maximum value of 600 - 700 kg/mm² and the hardened layer has a depth of 100 - 300 μ. The conditions of heat treatment of the bolts and of the pins and the obtained test results for these are summarised in a table on p. 4. The tests showed that irrespective of how the hardened layer is obtained on the surface of the steel, it does bring about an increase in sensitivity to slow failure. The characteristics of the hardened layer obtained thermo-chemically and by mechanical work hardening differ from each other. For a work-hardened surface layer, a steeply falling micro-hardness curve is characteristic; for a depth below 20 μ, the micro-hardness is 1.5 to 2 times that of the micro-hardness of the core. For the investigated steel, the presence of thin, thermo-chemically hardened surface layers increases the sensitivity to distortion and slow failure of bolts and pins up to 2.5-fold under certain unfavourable conditions. The work-hardening produced during cutting of threads on heat-treated components of this steel increases the notch sensitivity and the sensitivity to slow failure by more than 1.5 times under certain conditions.

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Influence of the surface state on the tendency of steel
30X15CA to slow failures. (Cont.) 129 - 8 - 1/16

There are 5 figures, 1 table and 4 Slavic references.

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Card 4/4

SADOVSKIY, Ya. [Sadouski, IA.]

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(Russia--Invasion of 1812) (Borisov--Historical museums)

SADOVSKIY, Yu.A.

Zonality of the fields of rare metal granite pegmatites. Vest.
AN Kazakh. SSR 20 no.6:78-86 Je '64 (MIRA 18:1)

IVANOV, V.L.; IVATSIK, Ya.Ya.; NASHATYR', V.M.; PIKHAZEVA, A.I.;
SADOVSKIY, Yu.D.

Installation for combined testing of valve dischargers. Trudy
LPI no.195:511-522 '58. (MIRA 11:10)
(Electric discharges)

SADOVSKIY, Yu.D.; TUZHIK, R.G.

Use of an electrodynamic model for studying high-speed automatic reclosing as a means for increasing the stability of electric power transmission between the Stalingrad Hydroelectric Power Station and Moscow. Izv. NIPT no.6:270-276 '60. (MIRA 14:7)
(Stalingrad Hydroelectric Power Station)
(Electric power distribution--Models)
(Electric network analyzers)

BELOUSOV, V.R.; SADOVSKIY, Yu.D.

Device for measuring e.m.f. phase shifts in electrical system
models. Izv. NIIP no.6:277-283 '60. (MIRA 14:7)

(Electric network analyzers)

(Electronic measurements)

(Electric machinery, Synchronous)

YENAL'YEV, V.D. [IEnal'iev, V.D.]; ZAYTSEVA, V.V.; SADOVSKIY, Yu.S.
[Sadovs'kyi, IU.S.]; BATOG, A.Ye. [Batch, A.IE.]; SADOVSKAYA, T.M.
[Sadovs'ka, T.M.]

Thermal stability and initiating activity of substituted benzoyl
peroxide. Khim.prom. [Ukr.] no.1:17-20 Ja-Mr '64. (MIRA 17:3)

YENAL'TOV, V.B.; ZAYTSEVA, V.V.; SADOVSKIY, Yu.S.; SADOVSKAYA, T.M.;
NAZAROVA, Z.F.

Polymerization of styrene initiated by bifunctional peroxides.
Vysokom. soed. 7 no.2:275-279 F '65.

(MIRA 18:3)

1. Ukrainskiy nauchno-issledovatel'skiy institut plasticheskikh
mass.

YENAL'YEV, V.D.; ZAYTSEVA, V.V.; SADOVSKIY, Yu.S.; SADOVSKAYA, T.N.;
SOROKINA, A.N.

Kinetics of styrene polymerization in the presence of some tert-amyl
peracylates. Ukr. khim. zhur. 31 no.8:834-838 '65. (MIRA 18:9)

1. Ukrainskiy nauchno-issledovatel'skiy institut plasticheskikh mass.

ONDREJCOVIC, Gregor, inz.; SADOVSKY, Ondrej, inz.; GAZO, Jan, doc. inz.CSc.

Preparation of solvates of copper perchlorates with acrylonitrile. Chem zvesti 18 no.4:281-284 '64

1. Department of Inorganic Chemistry, Slovak Higher School of Technology, Bratislava, Kollarovo namesti 2.

SADOVSKY, Stefan

Niektore poznatky z polnohospodarstva SSSR; STS, sovchozy; Vsesv zova polnohospodarska vystava. (Some Experiences from the Agriculture of the Soviet Union; Machine tractor stations, State farms, All-Union Agricultural Exhibition. bibl., tables) Bratislava, Slov. vyd. polnohosp. lit., 1957 79 p. Vol. 41 of the series Polnohospodarska ekonomika (Agricultural economics).

Valuable description of the organization and expansion of the plant and animal production in the Soviet Union. The readers will find in the book the description of the new organization of the management of agriculture and introduction of the new work methods. The picture supplement contains beautiful views from the All-Union Agricultural Exhibition in Moscow.

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1. Vedouci ucetni, Jihoceska Medika, narodni podnik.

(DRUG INDUSTRY

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DUBROVNER, M.; SADOVYKH, I.

"Accounting in industry." S.I. Seleznev, P.Kh. Shneivas,
M.A. Merkulov. Reviewed by M.Dubrovner, I. Sadovykh. Bukhg.
uchet. 15 no.8:57-61 Ag '56. (MLRA 9:10)

(Accounting) (Seleznev, S.I.) (Shneivas, P.Kh.)
(Merkulov, M.A.)

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PROCESSES AND PROPERTIES UNDER
LIST AND TWO COLUMNS

Sugar and molasses from the Jerusalem artichoke. 1.
R. Sudovyi and S. Z. Ivanov. *Trudy Vsesoyuzn. Khim.-
Tekhnol. Inst.* 1, 100-114 (1938). Up to 30% carbohy-
drates were found in wide varieties of Jerusalem artichoke
by hydrolysis with HCl or H₂SO₄. 10 references.
J. G. Tolpin

PROCESSES AND PROPERTIES																									
<p>Adsorption of surface-active substances from sugar solutions by norite and by kieselguhr. I. E. Sadovyl. <i>Trudy Voronezh. Khim.-Tekh. Inst.</i> 2, 68-92(1938); <i>Khim. Referat. Zhur.</i> 1, No. 11-12, 162(1938).—Norite adsorbs the surface-active colored substances at an increased temp. (80°) better than in the cold. CaO and colloids are adsorbed but little. Kieselguhr (from Caucasus) does not change the color of the solns., and it adsorbs the colloids and CaO slightly. A new method is proposed for the prepn. of a standard soln. for the detn. of the degree of coloring by treating the soln. of invert sugar with lime. W. R. Hume</p>																									
<p>ASAC S.A. METALLURGICAL LITERATURE CLASSIFICATION</p>																									

1ST AND 2ND ORDER																									
PROCESSES AND PROPERTIES INDEX																									
<p>Viscosity of fodder molasses. I. E. Sadovyl. <i>Trudy Vsesoyuzn. Khim.-Tekhnol. Inst.</i> 2, 93-101 (1938). The viscosity of molasses from 4 different regions of U. S. S. R. was studied because the available data refer only to foreign molasses and their value is lessened by the fact that the samples to which the data refer were treated with activated carbon before the detn. With decrease of temp. from 50 to 40°, the viscosity increases 2.5 times, with further decrease to 30°, 3 times. With rise of the concn. of dry matter from 80 to 82%, the viscosity increases 2.5 times and with further rise to 84%, almost 3 times, for which the combination of water with sugar and nonsugars is responsible. Normal molasses from different regions show little difference in viscosity. Ca salts, especially those resulting from decompn. of invert sugar by lime, greatly increase the viscosity; other ash components also affect it. No change in the coeff. of viscosity was observed with rise of the pressure in the dropping-ball viscometer from 100 to 600 mm. Hg. Elec. cond. may serve as a measure of viscosity only above 40°; below 40°, rise of °Brix increases the viscosity more than the elec. resistance.</p> <p style="text-align: right;">J. G. Tolpin</p>																									
<p>ASB-SLA METALLURGICAL LITERATURE CLASSIFICATION</p>																									
<p>1ST AND 2ND ORDER</p>																									